

Mojolaoluwa "Mojo" Oke

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Education

Massachusetts Institute of Technology (MIT)

Cambridge, MA

B.S. IN MECHANICAL ENGINEERING (COURSE 2), MINOR IN JAPANESE — GPA: 4.9/5.0

Sept. 2018 - May 2022

- **Awards & Honors:** Thomas Sheridan Prize for Creativity in Man-Machine Integration (2022), S. Klein Prize for Technical Writing [2nd Place] (2022), Miyagawa Japanese Prize (2021), Pi Tau Sigma Honor Society (2020 — Present)

Work Experience

Gener8 LLC

Wilmington, MA

MECHANICAL ENGINEER

Jul. 2022 — Present

- **Designed mechanical subsystems of five medical instruments, such as bioprocessing systems, chemical sterilizers, medical lasers, and optical diagnostics.**
- Performed *Nusselt analysis*, *CFD simulation*, analytical modeling of heat transfer to design, test, and successfully deliver a TEC-powered manifold reflux condenser that tripled its cooling capacity and eliminated issue of fluid flooding between condenser and bioreactor of 15-liter bioprocessing system.
- Developed with *Python* a protocol that automated and tripled the speed of tests for pressure leaks to expedite the inspection of a 40-unit lot of bioreactors.
- Experimentally determined driving variables and re-designed scrubbing module to reduce the gas scrubbing time of gas chemical sterilizer by 75%.

LiquiGlide Inc

Cambridge, MA

BIOMEDICAL ENGINEER INTERN

Jun. 2021 — Aug. 2021

- **Studied and identified suitable coatings for use in ostomy bags to prevent pancaking and reduce drainage time.**
- Designed and built an upgraded gear-powered stool dispensing test apparatus to double sample capacity and improve simulation accuracy of ostomy bag coating performance testing.
- Developed protocols for and ran R&D wet lab experiments using the *rheometer*, *FTIR scanner*, and *tensile tester* to characterize coating performances.

MIT D-Lab

Cambridge, MA

UNDERGRADUATE RESEARCHER

Sept. 2020 — Nov. 2020 | Feb. 2021 — May 2021

- **Designed and tested subsystems for a low-cost evaporative cooling device within a shipment container for improving fruit and vegetable storage in Kenya.**
- Designed internal sliding door system to account for maximal access to stored items while minimizing thermal loss in the cooling network.
- Provided usability and thermal analyses for alternative designs of various actuating mechanisms, door position configurations, and handles.

MIT Design Computation & Digital Engineering Lab

Cambridge, MA

UNDERGRADUATE RESEARCHER

Jun. 2020 — Aug. 2020

- **Investigated the use of machine learning models to aid the product design process by determining novelty.**
- Implemented *robust covariance*, *isolation forest*, *one-class SVM*, and *local outlier factor* machine learning models using *scikit-learn* to determine novel outliers in a set of glassware.
- Visualized correlations with the machine learning models using *determinantal point process*, *convex hull*, and *enclosing hypersphere* diversity metrics to determine the models' suitability for outlier detection.

MIT Computer Science & Artificial Intelligence Lab

Cambridge, MA

UNDERGRADUATE RESEARCHER

Jun. 2019 — Aug. 2019

- **Investigated methods of programming and fabricating a swarm of mini self-folding robots in a laser cutter.**
- Developed a syringe pump prototype to dispense solder paste in the fabrication process.
- Repurposed C++ code to demonstrate low-level control of operating parameters in laser cutting operations to achieve cutting the outline and etching bend lines of the swarm bots in one process cycle.

Skills: Medical device design, Design for manufacturing, Thermal systems design, Design failure mode and effect analysis

Software: SolidWorks, Fusion 360, Adobe Lightroom & Illustrator, MS Office Suite, Smartsheet

Productions: Mill, Lathe, 3D printing, Laser cutting, Waterjet, Injection molding, Thermoforming, MIG welding

Programming: Python, MATLAB, Arduino | **Languages:** English (native), Japanese (intermediate), Yoruba (novice)

Academic Projects

Benchtop Welding Positioner Spindle

Cambridge, MA

UNDERGRADUATE THESIS

Jan. 2022 — May 2022

- Underwent and analyzed the development process, design trade-offs, and loading forces of a welding positioner spindle 166 mm tall with an 88 mm through hole, which are respectively shorter and wider than market options.
- Developed a motor configuration heat map based on motor torque, speed, and resolution for varying pulley gear ratios with dimensional requirements to inform motor selection and specification of the pulley power transmission.
- Turned parts as wide as 175 mm on the lathe by machining features like bores, custom-size internal & external threads, and grooves, assembled mechanical parts with fasteners and MIG welding, designed electronics breadboard for motor control, and completed functional spindle prototype.
- Designed and ground custom lathe grooving tools to overcome setup interference constraints with the available tools.

Low-cost UVC Disinfection Box

Cambridge, MA

2.722J D-LAB: DESIGN

Mar. 2021 — May 2021

- Designed & built a working prototype of a low-cost, UVC LED-disinfecting device ready for Biosafety Level 1 lab testing intended for doctors in low-resource hospitals in South Africa.
- Identified novel application of quartz glass rods that reduced prototyping costs of the device by 10 times and exposed entire surface area of items to UVC light for comprehensive disinfection.
- Assembled electronic breakout boards and programmed state machine setup in C++ to set up controlled disinfection runs and implement user safety interlocks and feedback.
- Analytically modeled heat dissipation from LEDs to validate the enclosure maintaining an outer temperature within a specified comfortable-to-handle range.

Additional Experience

Camp Kesem at MIT

Cambridge, MA

PROGRAM COUNSELOR | UNIT LEADER | TEEN ADVISOR

Sept. 2018 — Mar. 2022 | Aug. 2024

- As a post-graduate Teen Advisor in summer 2024, provided logistical support to admin for a 1-week camp with 120 campers, served as a designated driver for hospital emergencies, and mentored the counselors and unit leaders.
- In summer 2020, stepped up after a last-minute vacancy to serve as a Unit Leader, led a unit of 8 counselors serving 10 teens, facilitated several activity modules, resolved camper conflicts, and provided a supportive, exciting remote camp experience for 80 campers via Zoom.

Aletheia Church

Cambridge, MA

KIDS' TEAM 1ST-5TH GRADE TEACHER

Jul. 2023 — Present

- Serving my church by preparing fun activities, guiding students through lessons, and fostering a loving classroom environment with up to 20 kids, where they can learn and grow spiritually, emotionally, and socially on Sunday mornings.

MIT Cru

Cambridge, MA

SERVANT TEAM LEADER | VOLUNTEER

Jan. 2020 — Present

- As a post-graduate volunteer, providing logistical support with semesterly retreats and mentoring current students.
- Pioneered and implemented a new leadership structure by creating structured task forces led by each core leadership team (servant team) member, which engaged more members with leadership and ownership of the community, reduced the load on each servant team member, and improved the simultaneous planning processes of various initiatives.
- Organized and facilitated weekly events, which remotely engaged and retained the community during the COVID-19 campus closures, with 30-50 regular participants.

MIT African Students' Association

Cambridge, MA

FRESHMAN OUTREACH CHAIR | CULTURAL NIGHT EVENT COORDINATOR

May 2021 — April 2022

- Led and supervised multiple teams in planning and hosting the organization's marquee annual Cultural Night event of 130 attendees with interior décor, catered meals, entertainment performances, and a keynote speaker in the midst of consistently changing COVID-19 event restrictions and guidelines.
- Organized initiatives to connect African freshman with upperclassmen for cultivating friendship and mentorship.

MIT Leadership Training Institute

Cambridge, MA

LEADERSHIP MENTOR

Feb. 2021 — May 2021

- Led a group of high school students in leadership development activities to improve their self-confidence, team-working, and public-speaking skills as part of a program that cultivates their leadership potential by guiding them through the creation and execution of independent community service projects.